

**Distributed Energy
Resources For Federal
Facilities
Using
Industrial Gas Turbine
Generators**

Solar Turbines

A Caterpillar Company

Serving Power Generation Applications from 1-50 MW



Building Cooling, Heating and Power (BCHP)



Combined Heat and Power (CHP)



Combined Cycle (STAC)



Peaking (SC)

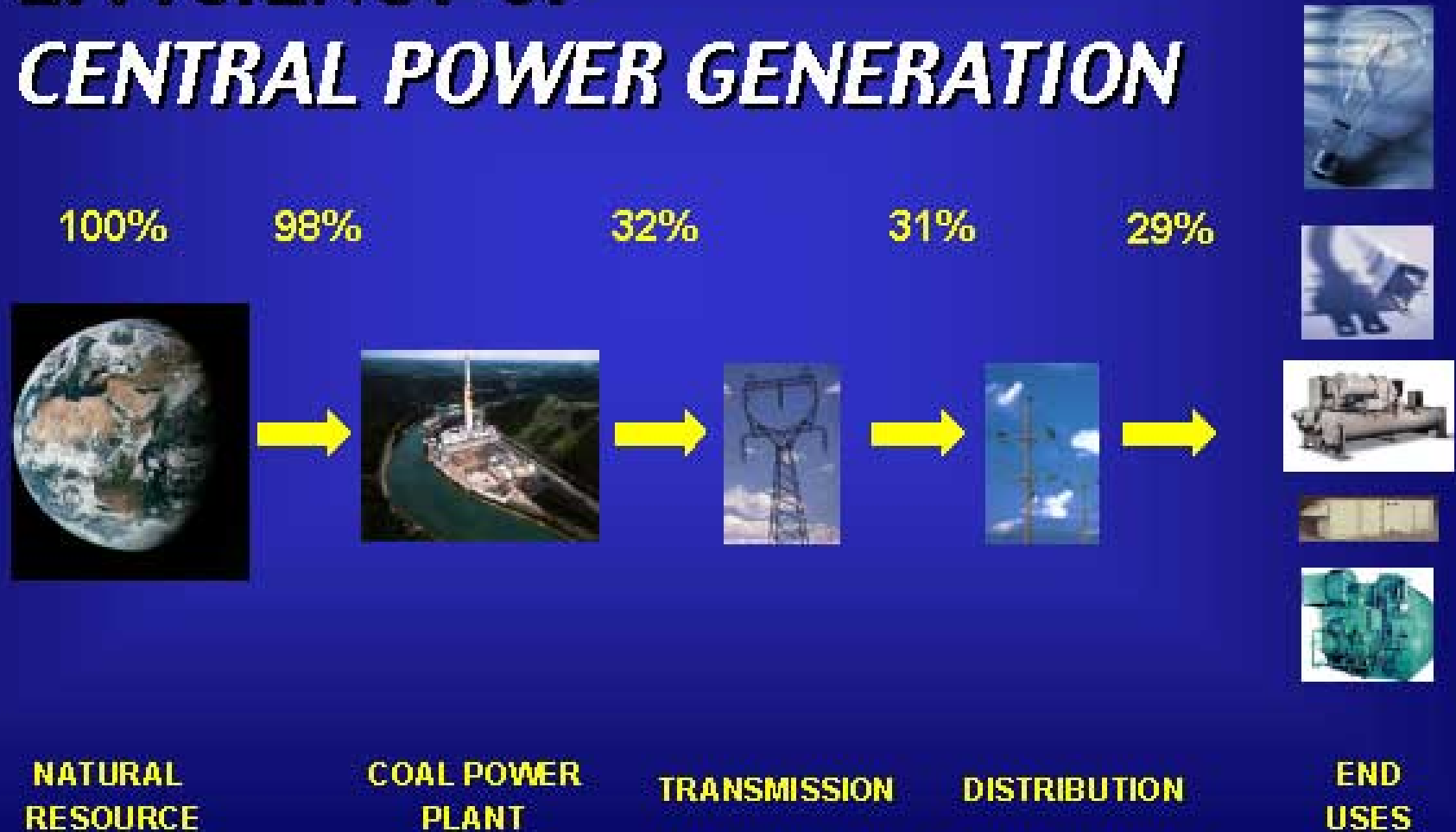
Broad Applications Experience in CHP

Application	No. of Units
Airports	8
Ceramic Manufacturing	57
Chemical / Petrochemical	122
Pharmaceuticals	24
Communications	2
District Heating	125
Food Processing	17
Government-Owned Power Generation	43
Hospitals	4
Hotels	8
Independent Power Producers (IPPs)	29
Investor-Owned Utilities	29
Landfill / Waste Treatment	62
Manufacturing	26
Mining	87
Municipals/Rurals/Cooperatives	180
Pulp and Paper	54
Textiles	11
Tires and Rubber	58
University / Research Facilities	39
Other Commercial	191
Other Industrial	484
Oil and Gas Applications	
Total	1577

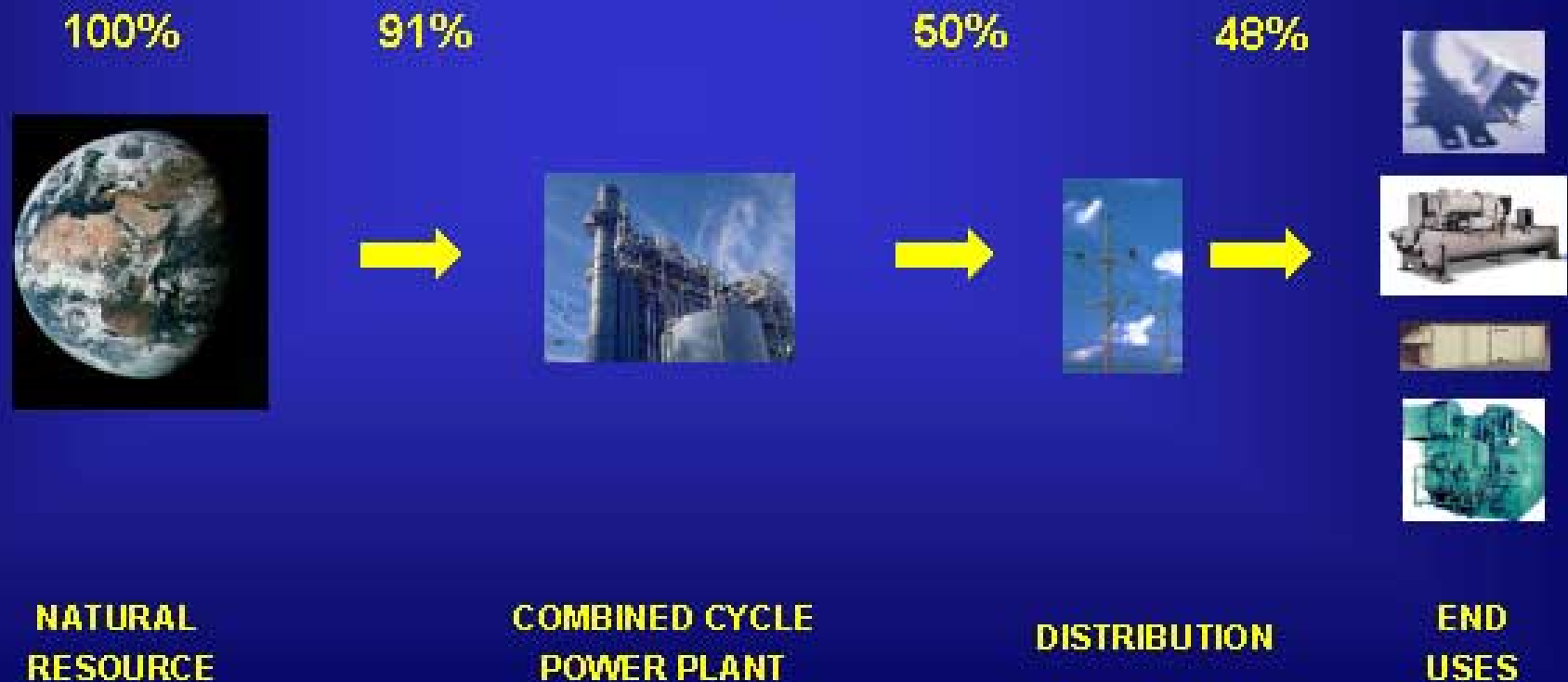
- **Improves Reliability of Power and Steam/Chilled Water Supply**
 - **Grid or other standby generators for backup**
- **Large Cost Savings**
 - **Typical Payback Period is 3 - 6 Years**
- **High efficiency**
- **Reduces Global Emissions**
- **Eliminates Grid Congestion**
- **Improves Fuel Utilization**

- **High Capital Cost**
- **Requires Consistent Fuel Supply**
- **Need Alternative Power Supply for 100% Reliability**
- **Economics Depend on Spark Spread Ratio**
- **Committed Capital Cost**

EFFICIENCY OF CENTRAL POWER GENERATION

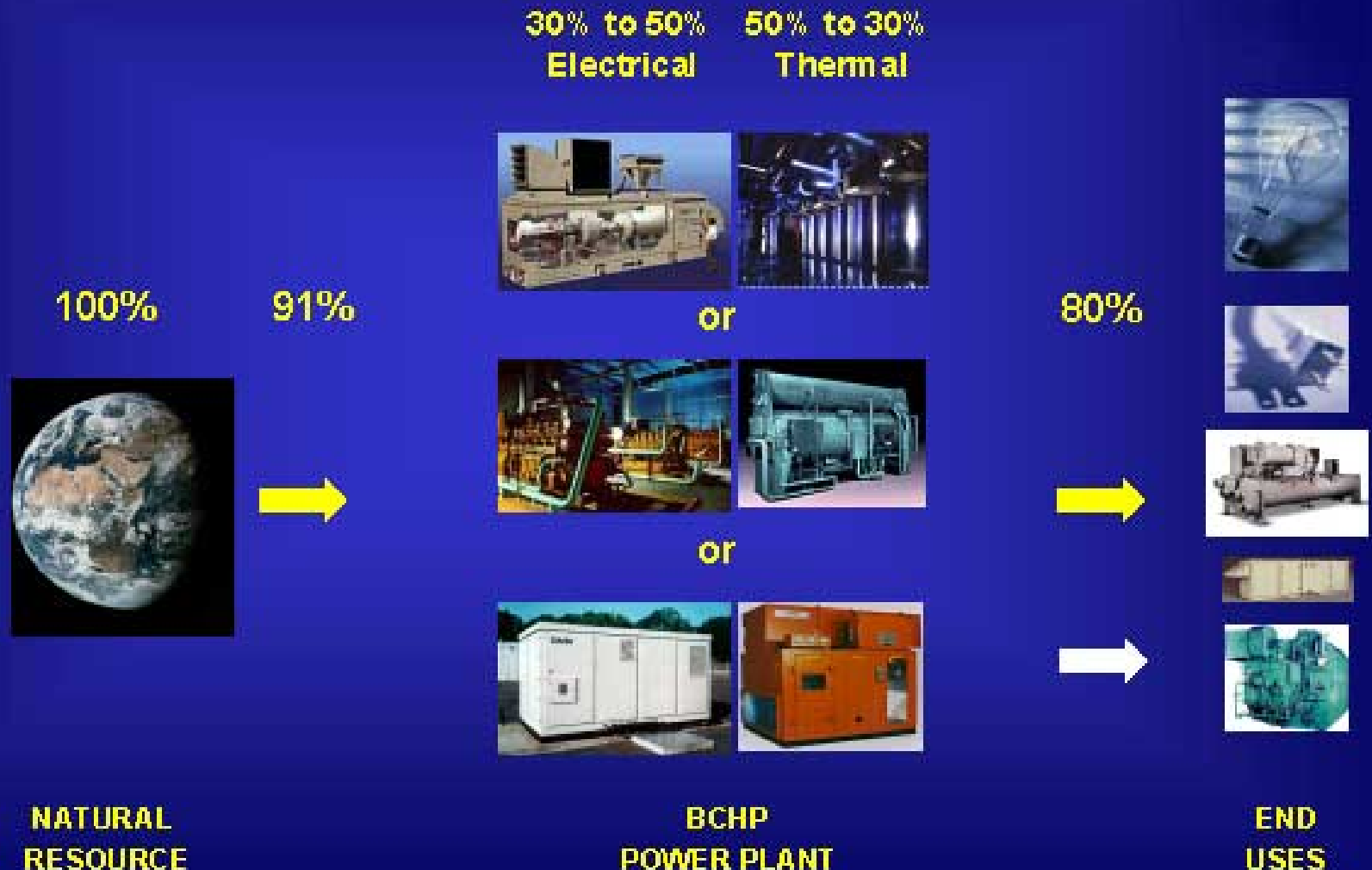


EFFICIENCY OF POWER DISTRIBUTED COMBINED CYCLE

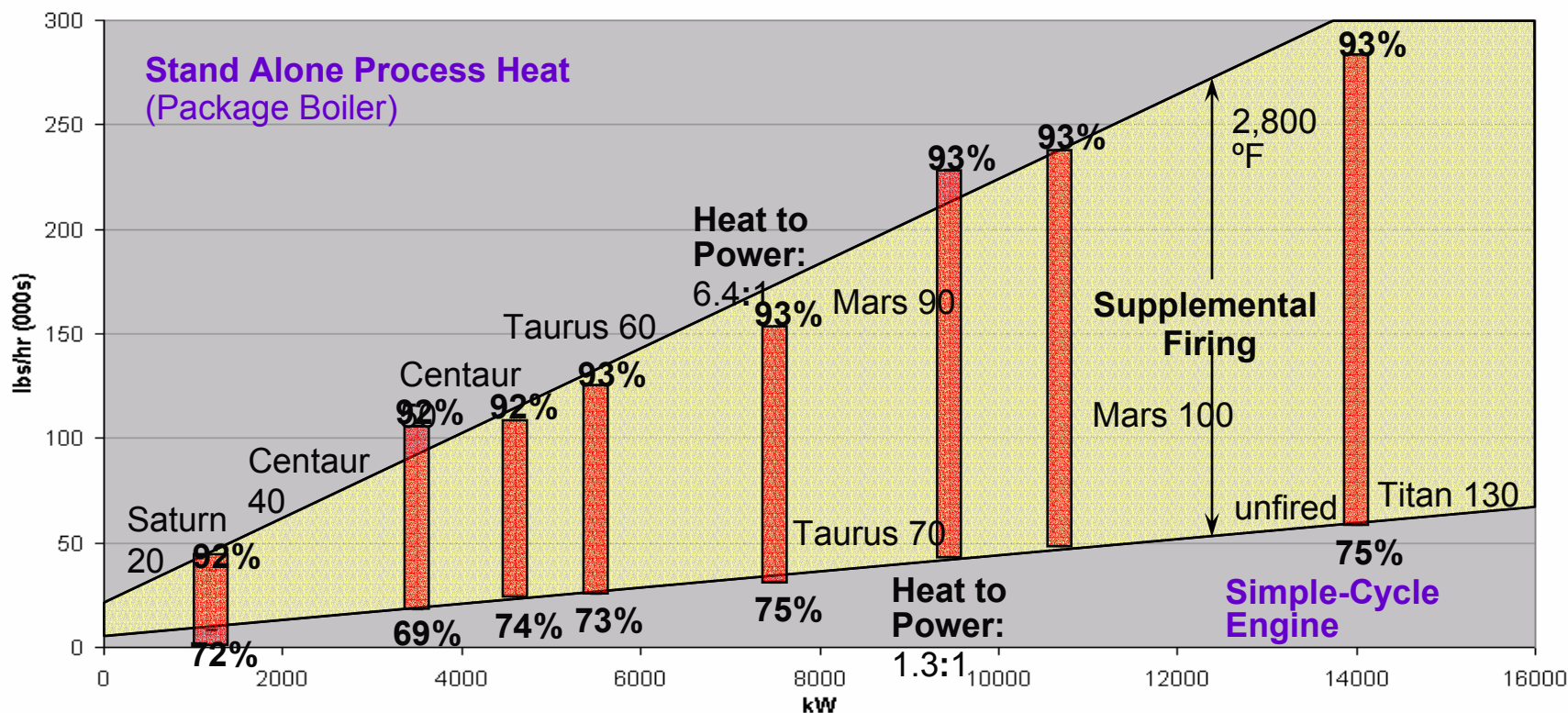


Efficiency Comparison - BCHP System

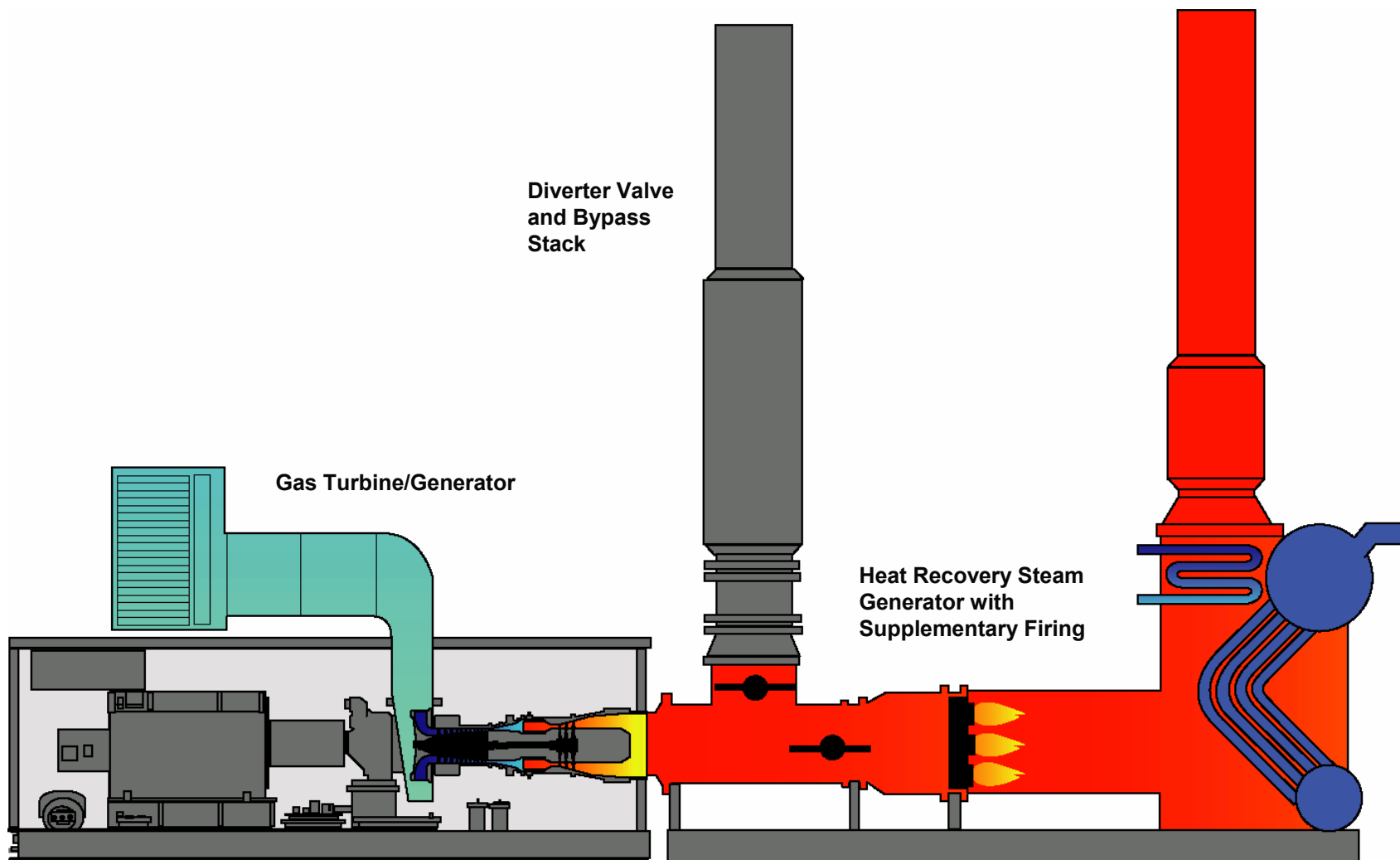
DELIVERED EFFICIENCY OF BCHP



Heat to Power Ratios for CT CHP Applications



Typical CHP System



CHP System Performance

		Exhaust Energy, MMBtu/hr	Steam Flow Unfired		Steam Flow Duct Fired to 1700oF	
Product	Power, MWE		Lb (000)/hr	Eff, %	Lb (000)/hr	Eff, %
Saturn 20	1.2	11.7	8.8	72	19.7	85
Centaur 40	3.4	28.7	18.8	69	56.1	84
Centaur 50	4.4	34.4	24.0	74	57.4	85
Taurus 60	5.4	38.7	30.0	73	67.8	87
Taurus 70	7.4	47.4	32.3	75	81.9	87
Mars 100	10.4	71.8	48.6	75	125.8	87
Titan 130	13.7	86.4	62.7	79	150.4	87

ISO Conditions: 59°F; 3 In. Inlet, 7 In. Exhaust Losses;
Sea Level; Saturated Steam @ 150 psig

Typical CHP Installations

Taurus 60 with Hi Fired
HRSG for a University

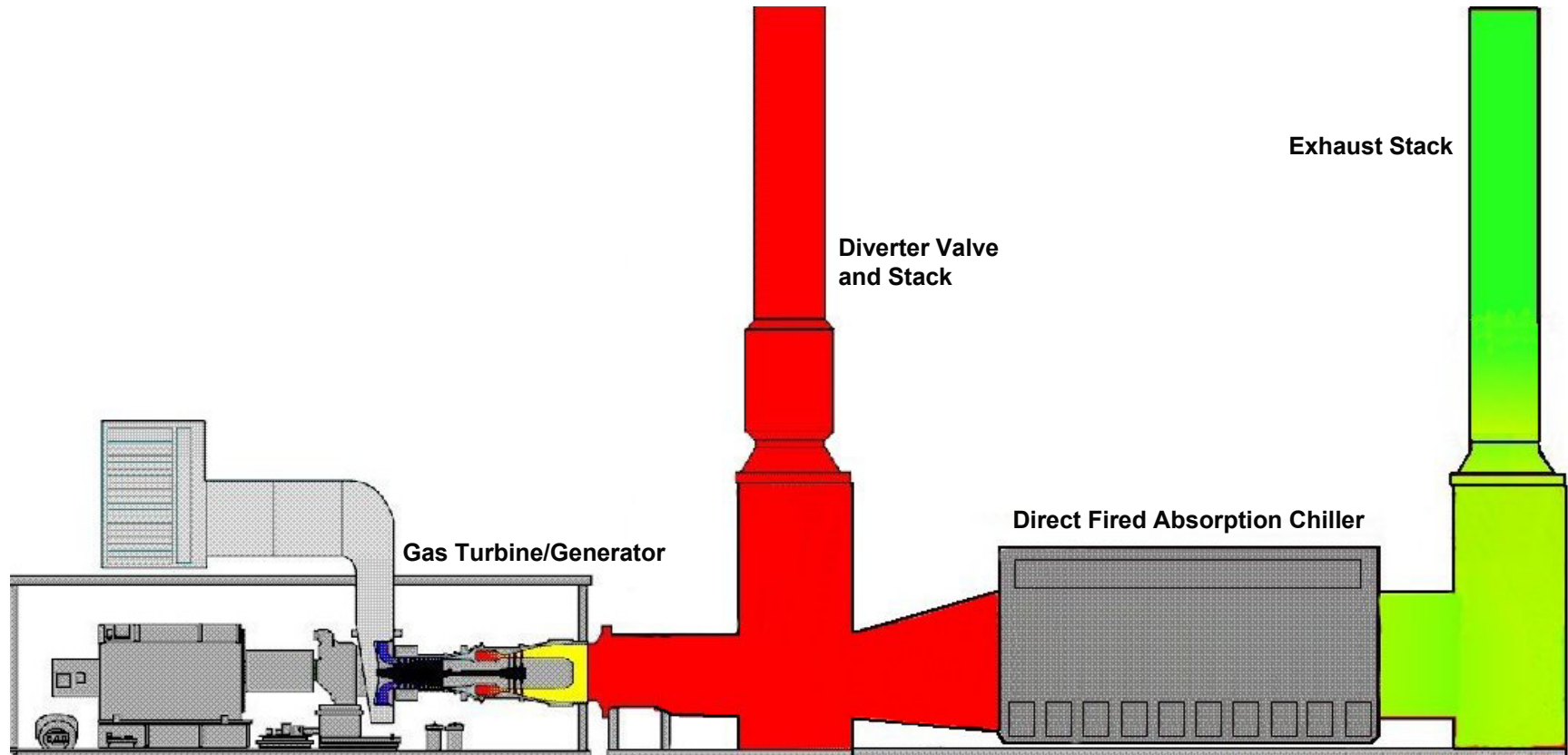


Centaur 40 with HRSG
and SCR in Irvine for a
Manufacturing Plant



Typical Building Heating, Cooling and Power Plant

Useful Outputs: Electrical Power, Chilled Water & Hot Water



Sound level of system - < 85 dBA at 1 meter

Example Package Footprint:
Saturn BChP - 10' x 60'
Centaur 40 BChP - 10' x 70'

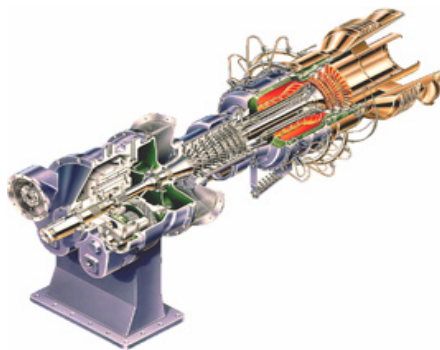
Engine Family	KW Output	Chilling, Tons	Heating, MMBTU/hr
Saturn 20	1200	855	7.4
Centaur 40	3400	1900	16.1
Centaur 50	4600	2500	21.6
Taurus 60	5400	2900	24.9
Taurus 70	7500	3300	28.2

Data above at ISO conditions, 15°C, sea level

Assumes double effect absorption chillers

Exhaust fired chiller can produce hot water temperatures up to 93°C

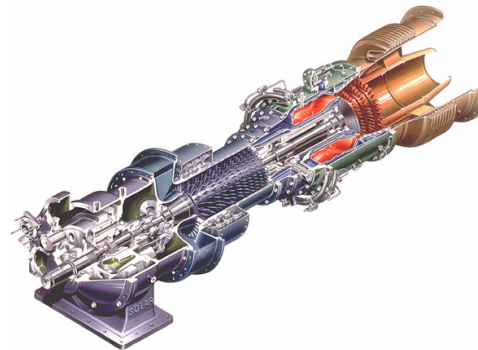
Solar's Power Gen Product Families



SATURN®

Saturn 20

1 210 kWe



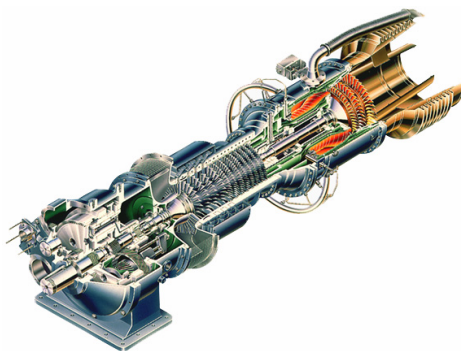
CENTAUR®

Centaur 40

3 515 kWe

Centaur 50

4 600 kWe



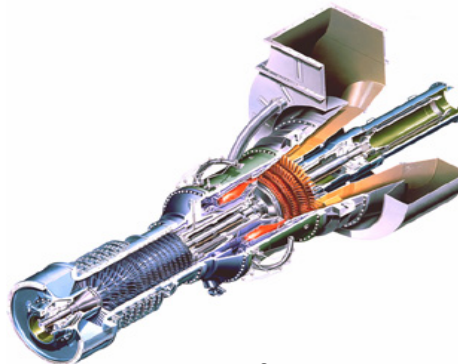
TAURUS™

Taurus 60

5 500 kWe

Taurus 70

7 500 kWe



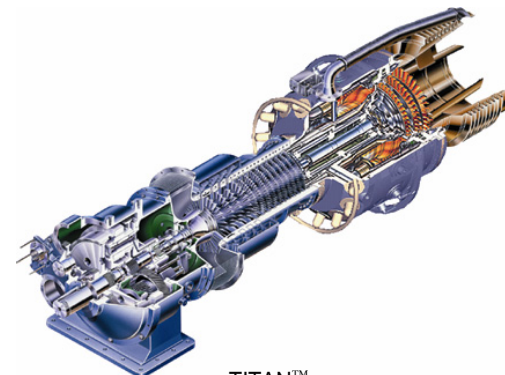
MARS®

Mars 90

9 285 kWe

Mars 100

10 695 kWe



TITAN™

Titan 130

14 000 kWe

Government / Military CHP Projects

● Lackland AFB, San Antonio, TX	10 MW
● General Services Administration, DC	10 MW
● Groton Navy Yard, Groton, CT	5 MW
● Valcartier AFB, Quebec City	3 MW
● Portsmouth Navy Yard, Portsmouth, NH	5 MW
● Balboa Naval Hospital, San Diego	3 MW
● U.S. Coast Guard, Kodiak, AK	6 MW
● National Animal Research Center, IA	1 MW
● Avenal State Prison, Avenal, CA	7 MW
● Hunterdon State Prison, Clinton, NJ	4 MW
● Otay State Prison, San Diego	3 MW
● Satellite Center, Sunnyvale, CA	12 MW
● Wisconsin State Prison, Waupun, WI	1 MW
● Twenty Nine Palms Marine Base, CA	7 MW
● Social Security Administration, MD	42 MW
● VA Hospital, North Chicago	5 MW
● VA hospital, West Chicago	3 MW

Balboa Naval Hospital, San Diego



Combined Heat and Power Plant



3x 1 MWe CT with HRSG

Lackland AFB, San Antonio, Texas



10 MW Combined Heat and Power Plant



10 MW Combined Heat and Power Plant



10 MW Combined Heat and Power Plant

Social Security Administration



42 MW Standby and Peaking Power Plant



42 MW Standby and Peaking Power Plant

Solar® Turbines

A Caterpillar Company

5 MWe of Portable Power



www.solarturbines.com

Solar Turbines
A Caterpillar Company
www.CAT.com

Search Site Map Help Contact Us
Username Password Login
Login Help

Home About Solar Oil & Gas Industry Power Gen Industry Customer Support

Planning For Your Summer Peaking Needs?
Solar Turbines offers a wide variety of combustion turbine products to meet your summer peaking needs for sites up to 100 MW. Both fixed and mobile configurations are available, some for immediate delivery.

Combined Cycle/STAC
While CHP users enjoy efficiencies of 70-93%, this efficiency decreases with decreasing thermal load. Solar designed the STAC system to provide a flexible solution for CHP applications with a variable thermal load.

Solar Announces the Availability of Energy Service Contracts
The Bottom Line - Solar's exclusive Energy Service Contract saves you money and allows you to concentrate on other things - like running your core business.

Related Information
Brochures

- Customer Services (723kb)
- Gas Turbine Generator Systems (2.8mb)
- Solutions for Utility Applications (350kb)
- (More...)

Case Studies

- Jackson EMC (250kb)
- Industrial Manufacturer Chooses Energy Service Contract (250kb)
- Cogeneration Project - Rice University (81 kb)
- (More...)

Datasheets

- Energy Service Contract (245kb)
- Taurus 60 Gas Turbine Mobile Power Unit (89kb)
- Titan 120 Gas Turbine

http://esolar.cat.com/solar/cda/unaauthorized/1,1389,7_1004_1348,1_00.html

Start Claudette C. Harris ... Microsoft PowerPoi... Solar Home Page ... Solar Turbines: ... Adobe Photoshop Local intranet 9:35 AM